Contents of Volume 33

Number 1. JANUARY 1974

OPINION

A national need: biologists on the Hill. *E. L. Hess* 1

LETTERS

T. H. Jukes, W. G. Clark 2

FASEB NEWS

Information from the August 1973 *FP* Questionnaire. *K. F. Heumann and R. S. Leisner* 3

SPECIAL ARTICLE

The Neurosciences Research Program. *D. M. Schneider* ... 6

SCIENCE NEWS

The Scientific Manpower Commission. *B. M. Vetter* 9

BOOKS RECEIVED 12

SYMPOSIA

RENAL HANDLING OF SODIUM
Chairman: *Barry M. Brenner*

Introductory remarks. *B. M. Brenner* 13
Glomerular ultrafiltration. *W. M. Deen, C. R. Robertson and B. M. Brenner* 14
Some aspects of proximal tubular salt reabsorption. *E. E. Windhager* 21
Membrane characteristics governing salt and water transport in the loop of Henle. *J. P. Kokko* 25
Sodium transport in the distal nephron. *M. Burg and L. Stoner* 31

PROSTAGLANDINS
Chairman: *James R. Weeks*

Introductory remarks. *J. R. Weeks* 37
Prostaglandins and renal function. *J. C. McGiff, K. Crowshaw and H. D. Itskovitz* 39
Prostaglandins as modulators of the autonomic nervous system. *M. J. Brody and P. J. Kadowitz* 48
Prostaglandins and the reproductive cycle. *A. P. Labhsetwar* 61
Prostaglandins and the thyroid gland. *K. Mashiter and J. B. Field* 78
Prostaglandins, calcium metabolism and cancer. *A. H. Tashjian, Jr., E. F. Voelkel, P. Goldhaber and L. Levine* 81

CONFERENCE

38TH ANNUAL POULTRY NUTRITION CONFERENCE: GASTROINTESTINAL DIGESTION AND ABSORPTION
Chairman: *W. R. Featherston*

Introduction. *H. L. Fuller* 87
Adaptive and nonadaptive changes in digestive enzyme capacity influencing digestive function. *J. T. Snook* 88
Examination of amino acids in ileal digesta as a measure of protein digestion. *H. S. Bayley, C. Y. Cho and J. H. G. Holmes* 94
Regulation of iron absorption. *D. Van Campen* 100
Intestinal parasitism and nutrient absorption. *D. E. Turk.* 106

Number 2. FEBRUARY 1974

OPINION

Education and the bioscientist. *F. F. Offner* 113

SPECIAL ARTICLE

Technology assessment and the politics of American biomedicine. *H. A. Schneider* 114

SCIENCE NEWS

The degu—for immunology study 118

BOOKS RECEIVED 120

SYMPOSIA

VASCULAR REACTIVITY IN HYPERTENSION
Chairman: *D. F. Bohr*

Determinants of vascular reactivity. *B. Johansson* 121
Reactivity of vascular smooth muscle from normal and hypertensive rats: effect of several cations. *D. F. Bohr* ... 127
Reactivity of ion fluxes in rat aorta during hypertension. *A. W. Jones* 133
How sodium and the kidney relate to the hypertensive arteriole. *L. Tobian* 139
Effects of sodium, angiotensin, and steroids on vascular reactivity in man. *F. M. Abboud* 144

PHARMACOLOGICAL AND BIOCHEMICAL PROPERTIES OF MICROTUBULE PROTEINS
Chairman: *L. Wilson*

Introductory remarks. *L. Wilson* 151
Biochemical properties of microtubules. *J. Bryan* 152
Interaction of drugs with microtubule proteins. *L. Wilson, J. R. Bamburg, S. B. Mizel, L. M. Grisham and K. M. Creswell* 158
Microtubule assembly in vitro. *G. G. Borisy, J. B. Olmsted, J. M. Marcum and C. Allen* 167

CONFERENCE

14TH ANNUAL RUMINANT NUTRITION CONFERENCE: APPLICATION OF SIMULATION MODELING TECHNIQUES IN ANIMAL SCIENCE
Chairman: *R. L. Baldwin*

Introductory remarks. *R. L. Baldwin* 175
Simulation of biological systems at the level of biochemistry and physiology. *D. Garfinkel, M. J. Achs and L. Dzubow* 176
Kinetic analysis of calcium metabolism in the cow. *C. F. Ramberg, Jr.* 183
Simulation of animal functions in models of production systems: ruminants on the range. *R. W. Rice, J. G. Morris, B. T. Maeda and R. L. Baldwin* 188
Interface of animal production and economic systems. *N. E. Smith and E. L. LaDue* 199

Number 3. MARCH 1974

Abstracts of Papers Presented at the Federation Annual Meeting 203
Exhibit Guide and Scientific Program 933

Number 4. APRIL 1974

OPINION

Science and public affairs: an encouraging trend. *C. S. Vestling* 1029

LETTER

S. Garb 1030

MEETING REPORT

The Seventh International Congress of the International Society of Developmental Biologists. *S. Roth* 1031

SCIENCE NEWS 1033

SPECIAL ARTICLE

Institute of Laboratory Animal Resources. *M. J. Anderson, R. H. Yager and C. B. Frank* 1036

SYMPOSIA

METABOLISM IN RELATION TO FUNCTION IN GANGLIA AND PERIPHERAL NERVES IN VERTEBRATES
Chairman: *M. G. Larrabee*

Embryological development of metabolic systems in sympathetic ganglia. *P. C. Marchisio* 1039
Metabolism of mammalian sympathetic ganglia. *M. Dolivo* 1043
Energy metabolism and supply of ~P to the fast axoplasmic transport mechanism in nerve. *S. Ochs* 1049
Role of cyclic AMP in synaptic transmission in the mammalian peripheral nervous system. *P. Greengard and J. W. Kebabian* 1059

SYNAPTIC ACTIONS ON RETINAL PHOTORECEPTORS
Chairman: *A. Lasansky*

Synaptic actions on retinal photoreceptors: structural aspects. *A. Lasansky* 1069
Lateral interaction between vertebrate photoreceptors. *D. A. Baylor* 1074
Feedback loop between cones and horizontal cells in the turtle retina. *E. J. Simon* 1078
Sensory interactions in the nudibranch mollusk *Hermissenda crassicornis*. *D. L. Alkon* 1083

REGULATION OF PROTEIN TURNOVER
Chairman: *H. E. Morgan*

Introduction. *H. E. Morgan* 1091
Protein turnover and amino acid metabolism in the regulation of gluconeogenesis. *P. Felig and J. Wahren* 1092
Insulin in the regulation of protein turnover in heart and skeletal muscle. *L. S. Jefferson, D. E. Rannels, B. L. Munger and H. E. Morgan* 1098
Interaction between hormones and cyclic AMP in regulating specific hepatic enzyme synthesis. *W. D. Wicks, C. A. Barnett and J. B. McKibbin* 1105
Physiological significance of protein degradation in animal and bacterial cells. *A. L. Goldberg, E. M. Howell, J. B. Li, S. B. Martel and W. F. Prouty* 1112

Number 5. MAY 1974

OPINION

Proposals for future annual FASEB meetings. *M. M. Winbury* 1121

SCIENCE NEWS

A registry of women and minority group biochemists is being established. *L. Leive* 1122

BOOKS RECEIVED 1124

SYMPOSIA

RESTRICTION AND MODIFICATION OF DNA: ENZYMES AND SUBSTRATES
Chairman: *H. W. Boyer*

Introduction. *H. W. Boyer* 1125
Host-controlled restriction and modification enzymes of *Escherichia coli*. B. *S. Linn, J. A. Lautenberger, B. Eskin and D. Lackey* 1128
Use of restriction endonucleases in analyzing the genome of simian virus 40. *D. Nathans, S. P. Adler, W. W. Brockman, K. J. Danna, T. N. H. Lee and G. H. Sack, Jr.* 1135

CONTROL OF FEEDING AND THE REGULATION OF ENERGY BALANCE
Chairman: *B. R. Baumgardt*

Introduction. *B. R. Baumgardt* 1139
Endocrine factors in the control of food intake. *G. A. Bray* 1140
Cholecystokinin and intestinal satiety in the rat. *G. P. Smith, J. Gibbs, and R. C. Young* 1146
Hypothalamic regulation of energy balance and feeding behavior. *J. Panksepp* 1150
Putative neurotransmitters in the hypothalamus and feeding. *C. A. Baile* 1166

ECOLOGICAL PROBLEMS OF HIGH LEVEL NUTRIENT FEEDING
Chairman: *R. J. Emerick*

Introduction. *R. J. Emerick* 1177
Fate of nitrogen under intensive animal feeding. *F. G. Viets* 1178
Consequences of high nitrate levels in feed and water supplies. *R. J. Emerick* 1183
Copper: soil, water, plant relationships. *D. E. Baker* 1188
High-level copper feeding of swine and poultry and the ecology. *G. K. Davis* 1194

COLLAGEN FORMATION
Chairman: *C. P. Leblond*

Biosynthesis of collagen: the biochemist's view. *E. J. Miller and V. J. Matukas* 1197
Formation of collagen. *M. Weinstock and C. P. Leblond* 1205

Scientific Program and Abstracts of Papers Presented at the Biochemistry/Biophysics 1974 Meeting 1219

Number 6. JUNE 1974

OPINION

NIH and the scientist—and a crisis of apathy. *M. B. Waitzman* 1677

LETTER

E. W. Westhead 1679

NEWS 1680

MEETING REPORT

Advances in human growth hormone research. A symposium. *S. Raiti and N. K. Maclaren* 1682

SPECIAL ARTICLE

Why FASEB? Mission, operations and financing. *E. L. Hess* 1686

SPECIAL TOPIC

Biomedical Literature and Information Services

Introduction. *K. F. Heumann* ... 1693
Biomedical information .services and the future. *R. T. Bottle* ... 1693
New approach to dissemination of scientific information. *E. S. Krudy* ... 1695
University of Sheffield Biomedical Information Service. *J. K. Barkla* ... 1698
Communication of scientific information at a cancer research institute. *S. B. Day, L. Old and R. A. Good* ... 1699
Biological Handbooks: compilation, processing, and dissemination of data. *P. L. Altman* ... 1701
Access to the biomedical literature through services produced at Chemical Abstracts Service. *F. A. Tate* ... 1712
Information support for the biomedical sciences. *H. E. Kennedy and D. A. Fisher* ... 1714
Computer-based retrieval services at The National Library of Medicine. *M. S. Day* ... 1717
Excerpta Medica's system for the automated storage and retrieval of biomedical information. *R. R. Blanken and B. T. Stern* ... 1719
The future of scientific communication. *D. Flanagan* ... 1721

SYMPOSIA

Metabolism of Membrane Lipids
Chairman: *P. R. Vagelos*

Genetic engineering of membrane lipid. *D. F. Silbert, J. E. Cronan, Jr., I. R. Beacham and M. E. Harder* ... 1725
Sterol carrier protein hypothesis. *T. J. Scallen, M. V. Srikantaiah, B. Seetharam, E. Hansbury and K. L. Gavey* ... 1733

Newer Candidates for Essential Trace Elements
Chairman: *W. J. Miller*

An introduction. *W. J. Miller* ... 1747
Recent dietary trace element research, exemplified by tin, fluorine, and silicon. *K. Schwarz* ... 1748
Silicon as an essential element. *E. M. Carlisle* ... 1758
Nickel: a new essential trace element. *F. H. Nielsen and D. A. Ollerich* ... 1767
Vanadium as an essential nutrient. *L. L. Hopkins, Jr. and H. E. Mohr* ... 1773

Number 7. JULY 1974

OPINION

The Life Sciences Research Office. *H. Pollack* ... 1777

LETTER

H. G. Fredericks ... 1778

SPECIAL ARTICLE

The bioavailability of iron sources and their utilization in food enrichment. *J. Waddell* ... 1779

BOOKS RECEIVED

... 1784

SYMPOSIA

Discriminable Properties of Drugs and State-Dependent Learning
Chairmen: *D. A. Overton and J. C. Winter*

Introduction. *D. A. Overton and J. C. Winter* ... 1785
Theoretical explanations of drug-dissociated behaviors. *D. K. Bliss* ... 1787
Differentiating stimulus and storage hypotheses of state-dependent learning. *D. C. Wright* ... 1797
Experimental methods for the study of state-dependent learning. *D. A. Overton* ... 1800
Classification of drugs according to their discriminable effects in rats. *H. Barry III* ... 1814
Hallucinogens as discriminative stimuli. *J. C. Winter* ... 1825
Alcoholic blackout and state-dependent learning. *D. W. Goodwin* ... 1833

CONFERENCE

Tracer Methodology and Glucose Turnover
Chairman: *M. Vranic*

An overview. *M. Vranic* ... 1837
Validity of the rates of production and utilization of metabolites as determined by tracer methods in intact animals. *G. Hetenyi, Jr. and K. H. Norwich* ... 1841
Glucose metabolism in ruminants: comparison of whole-body turnover with production by gut, liver, and kidneys. *E. N. Bergman, R. P. Brockman and C. F. Kaufman* ... 1849
Measurement and validation of nonsteady turnover rates with applications to the inulin and glucose systems. *J. Radziuk, K. H. Norwich and M. Vranic* ... 1855
Modeling the insulin-glucose system in man. *P. A. Insel, K. J. Kramer, R. S. Sherwin, J. E. Liljenquist, J. D. Tobin, R. Andres and M. Berman* ... 1865
A two-compartment calculator for the dog glucose pool in the nonsteady state. *R. Steele, H. Rostami and N. Altszuler* 1869

Number 8. AUGUST 1974

OPINION

A challenge to the future of FASEB. *R. M. Berne* ... 1877

SCIENCE NEWS

... 1878

BOOKS RECEIVED

... 1880

SYMPOSIA

Drugs and the Immune Response
Chairmen: *P. Calabresi and C. W. Parker*

Introductory remarks. *C. W. Parker* ... 1881
Selective immunosuppression by drugs in balanced immune responses. *G. H. Heppner, D. E. Griswold, J. DiLorenzo, E. A. Poplin and P. Calabresi* ... 1882
Selective immunosuppression using antigens and antibodies as pharmacologic agents. *G. W. Siskind* ... 1886
New approaches to immunosuppression. *L. R. Lyle and C. W. Parker* ... 1889
Drug-induced autoimmune disease. *E. M. Tan* ... 1894

Sound Localization
Chairman: *I. T. Diamond*

Introduction. *W. D. Neff* ... 1899
The auditory system of the medulla and localization. *J. M. Harrison* ... 1901
Adaptation for sound localization in the ear and brainstem of mammals. *R. B. Masterton* ... 1904
Neurophysiological mechanisms of sound localization. *A. Starr* ... 1911
A possible neurophysiological basis for the precedence effect. *I. C. Whitfield* ... 1915
Role of auditory cortex in sound localization: a comparative ablation study of hedgehog and bushbaby. *R. Ravizza and I. T. Diamond* ... 1917
Does tonotopicity subserve the perceived elevation of a sound? *R. A. Butler* ... 1920

Relations between the psychophysics and the neurophysiology of sound localization. *G. Moushegian and A. L. Rupert* ... 1924
Development of some mechanisms useful in sound localization. *S. D. Erulkar* ... 1928

NUTRITIONAL POTENTIAL FOR RECYCLING WASTE
Chairman: *R. J. Young*

Introduction. *R. J. Young* ... 1933
Evaluation of dehydrated poultry waste as a feed ingredient for poultry. *R. Blair* ... 1934
Poultry wastes as feedstuffs for ruminants. *J. P. Fontenot and K. E. Webb, Jr.* ... 1936
Animal wastes as substrates for protein production. *C. C. Calvert* ... 1938
Nutritional value of cattle waste for cattle. *W. B. Anthony* ... 1939
Composition and nutritive characteristics of low quality cellulosic wastes. *P. J. Van Soest and D. R. Mertens* ... 1942
Health criteria for processed wastes. *J. C. Taylor, D. A. Gable, G. Graber and E. W. Lucas* ... 1945

THE INFLUENCE OF EXERCISE ON THE MORPHOLOGY AND METABOLISM OF THE ISOLATED FAT CELL
Chairman: *C. M. Tipton*

Introductory remarks. *C. M. Tipton* ... 1947
Obesity: a brief overview with emphasis on exercise. *E. R. Buskirk* ... 1948
A review of development of adipose cellularity in man and animals. *J. S. Stern and M. R. C. Greenwood* ... 1952
Effect of exercise on adipose tissue cellularity. *L. B. Oscai, S. P. Babirak, J. A. McGarr and C. N. Spirakis* ... 1956
Rat fat cell size and number with exercise training, detraining and weight loss. *M. A. Booth, M. J. Booth and A. W. Taylor* ... 1959
Effect of training on adipocyte glucose metabolism and insulin responsiveness. *W. K. Palmer and C. M. Tipton* ... 1964

RECENT DEVELOPMENTS IN RESEARCH METHODS AND INSTRUMENTATION

Maintenance of human diploid fibroblasts as arrested populations. *R. T. Dell'Orco* ... 1969
Impact of Fourier transform techniques on high resolution NMR spectroscopy. *J. A. Glasel* ... 1973
Solid tissue masses formed in vitro from cells cultured on artificial capillaries. *R. A. Knazek* ... 1978

CORRECTION to Boyer article, May issue ... 1900

Number 9. SEPTEMBER 1974

OPINION

Public understanding of science. *E. L. Hess* ... 1983

LETTER

A. G. Ogston ... 1984

NEWS

The 1974 Passano Award ... 1985

BOOKS RECEIVED ... 1989

SPECIAL TOPIC

BIOMEDICAL EDUCATION

Introduction. *L. J. Mullins* ... 1991
Educational and Professional Affairs Committee of ASPET. *W. F. Riker, Jr.* ... 1992
Committee on Educational Affairs of ASBC. *T. M. Devlin* ... 1994
Basic scientific education for the future of medicine. *M. B. Visscher* ... 1996
Educational films for biochemistry. *J. M. Buchanan* ... 1998
Current activities of the APS Education Committee. *J. L. Kostyo* ... 2005
Science education: simulation methods for teaching process and content. *P. A. Small, Jr.* ... 2008
Multidisciplinary graduate training for biomedical science. *H. C. Pitot* ... 2013

SYMPOSIA

IMMUNOPATHOLOGY OF AGING
Chairman: *E. J. Yunis*

Immunopathology of aging. *E. J. Yunis and L. J. Greenberg* 2017
Immunologic theory of aging: current status. *R. L. Walford* 2020
Cell-mediated immunity and aging. *O. Stutman* ... 2028
Humoral immunity in aging. *A. A. Nordin and T. Makinodan* 2033
Longitudinal changes in serum immunoglobulin levels in older humans. *C. E. Buckley III, E. G. Buckley and F. C. Dorsey* ... 2036
Association of autoimmunity, immunodeficiency and aging in man, rabbits, and mice. *R. A. Good and E. Yunis* 2040
Spontaneous autoimmunity and involution of the lymphoid system. *P. O. Teague* ... 2051
Thymosin and the immunopathology of aging. *A. L. Goldstein, J. A. Hooper, R. S. Schulof, G. H. Cohen, G. B. Thurman, M. C. McDaniel, A. White and M. Dardenne* ... 2053
Aging and chronic virus infection: Is there a relationship? *M. B. A. Oldstone and F. J. Dixon* ... 2057

THE CEREBROSPINAL FLUID AND THE EXTRACELLULAR FLUID OF THE BRAIN
Chairman: *E. A. Bering, Jr.*

Introductory remarks. *E. A. Bering, Jr.* ... 2061
Transport mechanisms in the choroid plexus. *M. Pollay* ... 2064
Transport of material between brain extracellular fluid, brain cells and blood. *J. D. Fenstermacher, C. S. Patlak and R. G. Blasberg* ... 2070
Relationship between cerebrospinal fluid and interstitial fluid of brain. *H. F. Cserr* ... 2075
Amino acid transport mechanisms of the cerebrospinal fluid. *A. V. Lorenzo* ... 2079

Number 10. OCTOBER 1974

OPINION

Poster sessions: a better way to communicate. *R. A. Harte* ... 2087

NEWS FROM THE FEDERATION

Report of the Executive Director. *E. L. Hess* ... 2089
Report on the Annual Meetings of FASEB and ASBC. *H. B. Lemp* ... 2091
Distribution of FASEB General Funds. *J. R. Rice* ... 2093
Placement Service. *B. M. Clement* ... 2094
A reporter's view of poster sessions. *K. F. Heumann* ... 2095
Sara Leslie, Publications Manager, American Physiological Society. *P. F. Curran* ... 2096
Journal Editorial Board Sessions at the FASEB Annual Meeting. *R. S. Leisner* ... 2097
Editorial Board: *Journal of Lipid Research. L. I. Gidez* ... 2097
Board of Editors: *Clinical Chemistry. W. J. Campbell* ... 2099
Editorial Board: *Circulation Research. R. M. Berne* ... 2100
Editorial Advisory Board: *Drug Metabolism and Disposition: the biological fate of chemicals. K. C. Leibman* ... 2101
Editorial Board: *Microvascular Research. D. Shepro* ... 2102
Editorial Board: *The Journal of Clinical Pharmacology. McK. Cattell* ... 2103

BOOKS RECEIVED ... 2104

SPECIAL ARTICLES

Proteolytic processing in the biosynthesis of insulin and other proteins. *D. F. Steiner, W. Kemmler, H. S. Tager and J. D. Peterson* 2105

Ultrastructure of membrane lesions in immune lysis, osmotic lysis and drug-induced lysis. *P. Seeman* 2116

SYMPOSIA

PHYSIOLOGICAL ADAPTATIONS TO THE ENVIRONMENT
Organizer: *Bodil Schmidt-Nielsen*

Introductory remarks. *B. Schmidt-Nielsen* 2125

Respiration at high altitude. *N. Pace* 2126

Physiological effects on man of air pollutants. *D. V. Bates* .. 2133

Discussion of papers dealing with Respiration: Altitude and Air Pollution 2136

Osmoregulation: effect of salinity and heavy metals. *B. Schmidt-Nielsen* 2137

Mercurial toxicity and the perturbation of the mitochondrial control system. *J. Southard, P. Nitisewojo and D. E. Green* 2147

Discussion of papers dealing with Osmoregulation and Heavy Metals 2154

Temperature acclimation and behavioral thermoregulation in cold-blooded animals. *J. L. Roberts* 2155

Regulation of heat production at the cellular level. *P. W. Hochachka* 2162

Discussion of papers dealing with Temperature Regulation: Whole Organism and Cellular Level 2170

PHARMACOLOGY—MORPHOLOGY
Organizers: *R. L. Klein and Å. K. Thureson-Klein*

Introduction. *R. L. Klein and Å. K. Thureson-Klein* 2171

Histamine storage and release. *B. Uvnäs* 2172

Morphological contributions to monoamine pharmacology. *T. Hökfelt* 2177

Stereology applied to structure–function relationships in pharmacology. *R. P. Bolender* 2187

Pharmacomorphological aspects of large dense-core adrenergic vesicles. *R. L. Klein and Å. K. Thureson-Klein* .. 2195

Number 11. NOVEMBER 1974

LETTERS

T. R. Green, L. Leive 2207

NEWS 2208

BOOKS RECEIVED 2210

SPECIAL ARTICLES

Vitamin D: the vitamin and the hormone. *H. F. DeLuca* ... 2211

Tight and leaky junctions of epithelia: A perspective on kisses in the dark. *J. M. Diamond* 2220

Cost analysis and consequences of the National Cancer Plan. *P. P. Pekar, Jr.* 2225

SYMPOSIA

BIOCHEMICAL ASPECTS OF PULMONARY FUNCTION
Chairman: *J. A. Clements*

Introductory remarks. *J. A. Clements* 2231

Intermediary metabolism of the lung. *D. F. Tierney* 2232

The surfactant system of the lung. *R. J. King* 2238

Lung collagen: definition, diversity and development. *R. G. Crystal* 2248

Reaction mechanisms in the release of mediators of immediate hypersensitivity from human lung tissue. *K. F. Austen* 2256

SOME RECENT ADVANCES IN HUMAN NUTRITION RESEARCH
The W. O. Atwater Memorial Symposium
Chairman: *R. A. Gortner, Jr.*

Introductory remarks. *R. A. Gortner, Jr.* 2263

Nutrient composition of carrots, tomatoes and red tart cherries. *G. A. Leveille, C. L. Bedford, C. W. Kraut and Y. C. Lee* 2264

Nutrient changes in food processing. A current review. *R. O. Nesheim* 2267

Recent food consumption surveys and their uses. *F. Clark* .. 2270

Present knowledge of the role of chromium. *W. Mertz, E. W. Toepfer, E. E. Roginski and M. M. Polansky* 2275

ANTIBIOTICS AND NEOPLASIA
Chairman: *S. B. Horwitz*

Novel inhibitors of RNA synthesis. *S. B. Horwitz* 2281

Novel natural products with antitumor activity. *S. M. Kupchan* 2288

Chemistry and mechanism of action of bleomycin. *H. Umezawa* 2296

Clinically useful antibiotics obtained by directed chemical modification-lincomycins. *C. Lewis* 2303

Number 12. DECEMBER 1974

OPINION

Training grants for computer scientists? *C. M. Newton* 2307

LETTER

J. E. McShulskis and M. G. Brown 2308

SCIENCE NEWS

The UCLA Health Sciences Computing Facility. *J. Augustine* 2309

In appreciation 2310

SPECIAL TOPIC

CONFERENCE ON THE COMPUTER AS A RESEARCH TOOL IN THE LIFE SCIENCES
D. A. B. Lindberg, Conference Chairman

Keynote address. *D. A. B. Lindberg* 2311

Session I—Computer applications I

J. T. Apter, Organizer and Chairman

Introduction. *J. T. Apter* 2313

Computer analysis of protein sequences. *M. O. Dayhoff* 2314

Computerized clinical diagnosis. *H. L. Bleich* 2317

Biostatistical computing. *C. M. Newton* 2319

Mathematical models and membrane permeability. *R. I. Macey and L. T. Wadzinski* 2323

Cardiac surgical intensive care computer system. *L. C. Sheppard and J. W. Kirklin* 2326

Rapporteur's summary. *H. H. Gee* 2329

Session II—Computer applications II

E. A. Feigenbaum, Chairman

Introductory remarks. *E. A. Feigenbaum* 2331

Interactive three-dimensional computer graphics in molecular biology. *R. Langridge* 2332

Computer-aided reconstruction from serial sections. *C. Levinthal, E. Macagno and C. Tountas* 2336

Computer-based modeling and interpretation in medicine and psychology: the Rutgers Research Resource. *S. Amarel* 2341

Computer as a research tool in speech-understanding systems research. *D. R. Reddy* 2347

Computer-based auditory neurophysiology laboratory. *J. E. Hind and W. S. Rhode* 2351

Rapporteur's summary. *B. Saltzberg* 2355

Session III—Computer equipment configurations

C. E. Molnar, Organizer and Chairman

Introduction. *C. E. Molnar* 2357

Economy of scale and specialization-revisited. *J. R. Cox, Jr.* 2357

NIH computer hardware complex. *A. W. Pratt* 2361

Image processor for biomedical research. *B. H. McCormick, R. T. Borovec, J. S. Read and R. C. Amendola* 2365

Evolving macromodular molecular modeling system. *C. D. Barry, H. E. Bosshard, R. A. Ellis and G. R. Marshall* 2368

Toward a computerless computer facility. *T. H. Kehl* 2373

Rapporteur's summary. *H. Shipton* 2375

Session IV—Data base systems

J. A. Starkweather, Organizer and Chairman

Introductory remarks. *J. A. Starkweather* 2376

Functional goals and problems in large-scale patient record management and automated screening. *M. F. Collen, L. S. Davis, E. E. Van Brunt and J. F. Terdiman* .. 2376

Use of a psychiatric patient record system. *B. C. Glueck, R. P. Ericson and C. F. Strocbel* 2379

Use of table file structures in a clinical research center. *B. J. Ransil* 2384

Rapporteur's summary. *D. C. Goldberg* 2387

Session V—Networks and shared facilities

P. G. Lykos, Organizer and Chairman

Introduction. *P. G. Lykos* 2389

The PROPHET System and resource sharing. *W. F. Raub* 2390

MIRACLE-a hierarchical data acquisition system for laboratory automation. *R. B. Harrington and R. L. Giese* .. 2393

Economies and economics of network computers. *E. K. Bowdon, Sr., and W. J. Barr* 2395

Networks and the life sciences: the ARPA Network and Telenet. *F. E. Heart* 2399

CRYSNET, a crystallographic computing network with interactive graphics display. *E. F. Meyer, Jr., C. N. Morimoto, J. Villarreal, H. M. Berman, H. L. Carrell, R. K. Stodola, T. F. Koetzle, L. C. Andrews, F. C. Bernstein and H. J. Bernstein* 2402

Hierarchical computer systems for on-line applications. *R. L. Ashenhurst* 2405

Rapporteur's summary. *K. R. Wilson* 2407

Session VI—Meeting the costs

R. M. Davis, Chairman

Computing and competing for research dollars. *R. M. Davis* 2409

Meeting the real costs of the computer as a research tool in the life sciences. *R. M. Davis* 2409

Editor's note. *W. Siler* 2411

Industrial view of computer applications in the life sciences. *J. J. Baruch* 2412

Sponsorship of computing research in medicine and biology. *H. Moraff* 2413

A medical practitioner's view on computer applications in the life sciences. *R. Christensen* 2415

Progress in computer applications in the life sciences as seen by congressional staffs. *R. M. Maher* 2416

Closing remarks. *D. Lindberg* 2418

Observations on the Conference as seen by a British participant. *D. E. Clark* 2419

Conference summary and conclusions. *W. Siler* 2420

INDEXES

Subject 2423
Author 2427

EMPLOYMENT OPPORTUNITIES

Included in advertising pages, issues No. 2–12

PUBLIC AFFAIRS

Insert included at press time

Subject Index to Volume 33[1]

Access to the biomedical literature through services produced at Chemical Abstracts Service, **6**:1712
Adaptation for sound localization in the ear and brainstem of mammals, **8**:1904
Adaptive and nonadaptive changes in digestive enzyme capacity influencing digestive function, **1**:88
Adipose tissue cellularity,
  effect of exercise on, **8**:1956
  in man and animals, review of development of, **8**:1952
Adrenergic vesicles, pharmacomorphological aspects of large dense-core, **10**:2195
Aging,
  and chronic virus infection: is there a relationship?, **9**:2057
  humoral immunity in, **9**:2033
Air pollutants, physiological effects on man of, **10**:2133, 2136
Alcoholic blackout and state-dependent learning, **7**:1833
Amino acid
  in ileal digesta as a measure of protein digestion, an examination of, **1**:94
  metabolism, protein turnover in the regulation of gluconeogenesis, **4**:1092
  transport mechanism of the cerebrospinal fluid, **9**:2079
Animal
  feeding, fate of nitrogen under intensive, **5**:1178
  production, interface of and economic systems, **2**:196
  wastes as substrates for protein production, **8**:1938
Antitumor activity, novel natural products with, **11**:2288
APS education committee, current activities of the, **9**:2005
ASBC, committee on educational affairs of, **9**:1994
ASPET, educational and professional affairs committee of, **9**:1992
Association of autoimmunity, immunodeficiency and aging in man, rabbits, and mice, **9**:2040
Auditory system of the medulla and localization, **8**:1901
Autoimmune disease, drug-induced, **8**:1894
Autonomic nervous system, prostaglandins as modulators of, **1**:48

Balanced immune responses, selective immunosuppression by drugs in, **8**:1882
Basic scientific education for the future of medicine, **9**:1996
Behavioral thermoregulation in cold-blooded animals, temperature acclimation and, **10**:2155
Biochemical properties of microtubules, **2**:152
Biochemistry
  and physiology, simulation of biological systems at the level of, **2**:176
  educational films for, **9**:1998
Biological handbooks: compilation, processing, and dissemination of data, **6**:1701
Biomedical
  information services and the future, **6**:1693
  science, multidisciplinary graduate training for, **9**:2013
Biomedicine, technology assessment and the politics of American, **2**:114
Biostatistical computing, **12**:2319
Biosynthesis of collagen: the biochemist's view, **5**:1197
Bleomycin, chemistry and mechanism of action of, **11**:2296

Books Received

1:12; **2**:120; **5**:1124; **7**:1784; **8**:1880; **9**:1989, **10**:2104; **11**:2210
Brain extracellular fluid, brain cells and blood, transport of material between, **9**:2070

Calcium metabolism,
  kinetic analysis of in the cow, **2**:183
  prostaglandins and cancer, **1**:81
Cancer, prostaglandins and calcium metabolism, **1**:81
Cardiac surgical intensive care computer system, **12**:2326
Cattle waste for cattle, nutritional value of, **8**:1939
Cell-mediated immunity and aging, **9**:2028
Cerebrospinal fluid,
  amino acid transport mechanism of, **9**:2079
  and interstitial fluid of brain, relationship between, **9**:2075
Chemistry and mechanism of action of bleomycin, **11**:2296
Cholecystokinin and intestinal satiety in the rat, **5**:1146
Choroid plexus, transport mechanisms in the, **9**:2064
Chromium, present knowledge of role of, **11**:2275
Classification of drugs according to their discriminable effects in rats, **7**:1814
Clinically useful antibiotics obtained by directed chemical modification—lincomycins, **11**:2303
Cold-blooded animals, temperature acclimation and behavioral thermoregulation in, **10**:2155
Committee on educational affairs of ASBC, **9**:1994
Communication of scientific information at a cancer research institute, **6**:1699
Composition and nutritive characteristics of low quality cellulosic wastes, **8**:1942
Computer
  -aided reconstruction from serial sections, **12**:2336
  analysis of protein sequences, **12**:2314
  as a research tool in speech understanding systems research, **12**:2347
Computer-based
  auditory neurophysiology laboratory, **12**:2351
  modeling and interpretation in medicine and psychology; the Rutgers research resource, **12**:2341
  retrieval services at the National Library of Medicine, **6**:1717
Computerized clinical diagnosis, **12**:2317
Computerless computer facility, a trend, **12**:2373

Conference

  Conference on the computer as a research tool in the life sciences, **12**:2311–2421
  14th annual ruminant nutrition conference: application of simulation modeling techniques in animal science, **2**:175–202
  38th annual poultry nutrition conference: gastrointestinal digestion and absorption, **1**:87–112
Consequences of high nitrate levels in feed and water supplies, **5**:1183
Copper feeding of swine and poultry and the ecology, high level, **5**:1194
Copper: soil, water, plant relationships, **5**:1188
CRYSNET, a crystallographic computing network with interactive graphics display, **12**:2402
Current activities of the APS education committee, **9**:2005

Determinants of vascular reactivity, **2**:121
Development of some mechanisms useful in sound localization, **8**:1928
Differentiating stimulus and storage hypotheses of state-dependent learning, **7**:1794
Digestive enzyme capacity influencing digestive function, adaptive and nonadaptive changes in, **1**:88
Does tonotopicity subserve the perceived elevation of a sound?, **8**:1920
Drug-dissociated behaviors, theoretical explanations of, **7**:1787
Drug-induced autoimmune disease, **8**:1894

Economies
  and economics of network computers, **12**:2395
  of scale and specialization—revisited, **12**:2357
Education, biomedical, special topic, **9**:1991–2016
Educational
  and professional affairs committee of ASPET, **9**:1992
  films for biochemistry, **9**:1998

[1] This index covers volume 33 with the exception of no. 3 and no. 5, part II, the abstract issues, which carry their own permuted subject indexes. For each listing the first number, in bold face, which precedes the colon, refers to the issue number; the second number, or numbers, refer to the page number.

Effect of
exercise on adipose tissue cellularity, **8**:1956
training on adipocyte glucose metabolism and insulin responsiveness, **8**:1964
sodium, angiotensin, and steroids on vascular reactivity in man, **2**:143
Embryological development of metabolic systems in sympathetic ganglia, **4**:1039

Employment Opportunities

2:41a; **3**:115a (Part II); **4**:33a; **5**:49a; **6**:21a; **7**:33a; **8**:25a; **9**:33a; **10**:25a; **11**:35a; **12**:17a
Endocrine factors in the control of food intake, **5**:1140
Energy
balance and feeding behavior, hypothalamic regulation of, **5**:1150
metabolism and supply of P to the fast axoplasmic transport mechanism in nerve, **4**:1049
Essential elements:
Recent dietary trace element research, exemplified by tin, fluorine, and silicon, **6**:1748
Silicon as an essential element, **6**:1758
Nickel: a new essential trace element, **6**:1767
Vanadium as an essential nutrient, **6**:1773
Evaluation of dehydrated poultry waste as a feed ingredient for poultry, **8**:1934
Evolving macromodular molecular modeling system, **12**:2368
Examination of amino acids in ileal digesta as a measure of protein digestion, **1**:94
Excerpta Medica's system for the automated storage and retrieval of biomedical information, **6**:1719
Experimental methods for the study of state-dependent learning, **7**:1800

FASEB
A challenge to the future of FASEB (Opinion), **8**:1877
Distribution of FASEB general funds, **10**:2093
Information from the August 1973 FP questionnaire, **1**:3
Journal editorial board sessions at the FASEB Annual Meeting, **10**:2097
Placement service, **10**:2094
Proposals for future annual meetings, **4**:1121
Report of the Executive Director, **10**:2089
Report on the Annual Meetings of FASEB and ASBC, **10**:2091
Why FASEB? Mission, operations and financing, **6**:1686

FASEB Annual Meeting

Board of editors, *Clinical Chemistry*, **10**:2099
Editorial advisory board, *Drug Metabolism and Disposition*, **10**:2101
Editorial board, *Circulation Research*, **10**:2100
The Journal of Clinical Pharmacology, **10**:2103
Journal of Lipid Research, **10**:2097
Microvascular Research, **10**:2102
Fate of nitrogen under intensive animal feeding, **5**:1178
Feed ingredient for poultry, evaluation of dehydrated poultry waste as a, **8**:1934
Feedback loop between cones and horizontal cells in the turtle retina, **4**:1078
Folly of disassociating medical research from economic considerations, **12**:2415
Food
enrichment, the bioavailability of iron sources and their utilization in, **7**:1779
intake, endocrine factors in the control of, **5**:1140
Formation of collagen, **5**:1205
Functional goals and problems in large scale patient record management and automated screening, **12**:2376
Future of scientific communication, **6**:1693, 1721

Genetic engineering of membrane lipid, **6**:1725
Glucose metabolism in ruminants: comparison of whole-body turnover with production by gut, liver and kidneys, **7**:1849

Hallucinogens as discriminative stimuli, **7**:1825
Health criteria for processed wastes, **8**:1945
Heat production at the cellular level, regulation of, **10**:2162, 2170
Hierarchical computer systems for on-line applications, **12**:2405
High altitude, respiration at, **10**:2126
High level copper feeding of swine and poultry and the ecology, **5**:1194
High resolution NMR spectroscopy, impact of Fourier transform techniques on, **8**:1973
Histamine storage and release, **10**:2172
Hormone, vitamin D: the vitamin and the, **11**:2211
Host-controlled restriction and modification enzymes of *Escherichia coli*, **5**:1128
How sodium and the kidney relate to the hypertensive arteriole, **2**:138
Human
diploid fibroblasts as arrested populations, maintenance of, **8**:1969
lung tissue, reaction mechanisms in the release of mediators of immediate hypersensitivity from, **11**:2256
Humoral immunity in aging, **9**:2033
Hypertensive arteriole, how sodium and the kidney relate to the, **2**:138
Hypothalamic regulation of energy balance and feeding behavior, **5**:1150
Hypothalamus and feeding, putative neurotransmitters in the, **5**:1166

Ileal digesta, as a measure of protein digestion, examination of amino acids in, **1**:94
Image processor for biomedical research, **12**:2365
Immunity and aging, cell-mediated, **9**:2028
Immunologic theory of aging: current status, **8**:2020
Immunopathology of aging, **9**:2017
thymosin and the, **9**:2053
Impact of Fourier transform techniques on high resolution NMR spectroscopy, **8**:1973
Industrial view of computer applications in the life sciences, **12**:2412
Information support for biomedical sciences, **6**:1714
Insulin
and other proteins, proteolytic processing in the biosynthesis of, **10**:2105
in the regulation of protein turnover in heart and skeletal muscle, **4**:1098
responsiveness, effect of training on adipocyte glucose metabolism and, **8**:1964
Interaction
between hormones and cyclic AMP in regulating specific hepatic enzyme synthesis, **4**:1105
of drugs with microtubule proteins, **2**:158
Interactive three-dimensional computer graphics in molecular biology, **12**:2332
Interface of animal production and economic systems, **2**:196
Intermediary metabolism of the lung, **11**:2232
Intestinal
parasitism and nutrient absorption, **1**:106
satiety in the rat, cholecystokinin and, **5**:1146
Iron absorption, regulation of, **1**:100

Kinetic analysis of calcium metabolism in the cow, **2**:183

Lateral interaction between vertebrate photoreceptors, **4**:1074

Letters

1:2; **4**:1030; **6**:1679; **7**:1778; **9**:1984; **11**:2207; **12**:2308
Lincomycins—clinically useful antibiotics obtained by directed chemical modification, **11**:2303
Longitudinal changes in serum immunoglobulin levels in older humans, **9**:2036
Loop of Henle, membrane characteristics governing salt and water transport in, **1**:25
Lung,
intermediary metabolism of, **11**:2232
surfactant system of, **11**:2238
collagen: definition, diversity and development, **11**:2248
Lymphoid system, spontaneous autoimmunity and involution of the, **9**:2051
Lysis, immune, osmotic and drug-induced, ultrastructure of membrane lesions in, **10**:2116

Maintenance of human diploid fibroblasts as arrested populations, **8**:1969
Mammalian peripheral nervous system, role of cyclic AMP in synaptic transmission in the, **4**:1059
Man, rabbits, and mice, association of autoimmunity, immunodeficiency and aging in, **9**:2040
Mathematical models and membrane permeability, **12**:2323
Measurement and validation of nonsteady turnover rates with applications to the inulin and glucose systems, **7**:1855
Medicine, basic scientific education for the future of, **9**:1996

Meeting Reports

Advances in human growth hormone research. A symposium, **6**:1682
Seventh international congress of the International Society of Developmental Biologists **4**:1031
Meeting the costs, computers, **12**:2409
Membrane lesions, ultrastructure of, in immune lysis, osmotic lysis and drug-induced lysis, **10**:2116
Mercurial toxicity and the perturbation of the mitochondrial control system, **10**:2147, 2154

Metabolic systems, in sympathetic ganglia, embryological development of, 4:1039
Metabolism of mammalian sympathetic ganglia, 4:1043
Microtubules
assembly in vitro, 2:167
biochemical properties of, 2:152
proteins, interaction of drugs with, 2:158
MIRACLE—a hierarchical data acquisition system for laboratory automation, 12:2393
Mitochondrial control system, mercurial toxicity and the perturbation of the, 10:2147
Modeling the insulin–glucose system in man, 7:1865
Monoamine pharmacology, morphological contributions to, 10:2177
Morphological contributions to monoamine pharmacology, 10:2177
Multidisciplinary graduate training for biomedical science, 9:2013

National Cancer Plan, cost analysis and consequences of the, 11:2225
Nephron, sodium transport in the distal, 1:31
Networks and the life sciences: the ARPA network and Telenet, 12:2399
Neurophysiological
basis for the precedence effect, possible, 8:1915
mechanisms of sound localization, 8:1911
New approaches to
dissemination of scientific information, 6:1695
immunosuppression, 8:1889

News

6:1680; 11:2208
1974 Passano award, 9:1985
Nickel: a new essential trace element, 6:1767
NIH computer hardware, 12:2361
Nonsteady state, a two-compartment calculator for the dog glucose pool in, 7:1869
Novel
inhibitors of RNA synthesis, 11:2281
natural products with antitumor activity, 11:2288
Nutrient
absorption, intestinal parasitism and, 1:106
changes in food processing. A current review, 11:2267
composition of carrots, tomatoes, and red tart cherries, 11:2264
Nutritional value of cattle waste for cattle, 8:1939

Obesity: a brief overview with emphasis on exercise, 8:1948

Opinion

A challenge to the future of FASEB, 8:1877
Education and the bioscientist, 2:113
The Life Sciences Research office, 7:1777
A national need: biologists on the Hill, 1:1
NIH and the scientist—and a crisis of apathy, 6:1677
Poster sessions: a better way to communicate, 10:2087
Proposals for future FASEB meetings, 5:1121
Public understanding of science, 9:1983
Science and public affairs: an encouraging trend, 4:1029
Training grants for computer scientists? 12:2307
Osmoregulation: effect of salinity and heavy metals, 10:2137, 2154

Pharmacologic agents, selective immunosuppression using antigens and antibodies as, 8:1886
Pharmacomorphological aspects of large dense-core adrenergic vesicles, 10:2195
Photoreceptors, lateral interaction between vertebrate, 4:1074
Physiological
effects on man of air pollutants, 10:2133
significance of protein degradation in animal and bacterial cells, 4:1112
Poultry wastes as
a feed ingredient for poultry, evaluation of dehydrated, 8:1934
feedstuffs for ruminants, 8:1936
Present knowledge of the role of chromium, 11:2275
Processed wastes, health criteria for, 8:1945
Progress in computer applications in the life sciences as seen by congressional staffs, 12:2416
PROPHET system and resource sharing, 12:2390
Prostaglandins
and renal function, 1:39
and the reproductive cycle, 1:61
and the thyroid gland, 1:78
as modulators of the autonomic nervous system, 1:48
calcium metabolism and cancer, 1:81
Protein
degradation in animal and bacterial cells, physiological significance of, 4:1112
digestion, examination of amino acids in ileal digesta as a measure of, 1:94
turnover and amino acid metabolism in the regulation of gluconeogenesis, 4:1092
turnover in heart and skeletal muscle, insulin in the regulation of, 4:1098
Proximal tubular salt resorption, some aspects of, 1:21

Public Affairs

see insert in each issue
Putative neurotransmitters in the hypothalamus and feeding, 5:1166

Rat
aorta, reactivity of ion fluxes in during hypertension and circulatory control, 2:133
fat cell size and number with exercise training, detraining and weight loss, 8:1959
Reaction mechanisms in the release of mediators of immediate hypersensitivity from human lung tissue, 11:2256
Reactivity of
ion fluxes in rat aorta during hypertension and circulatory control, 2:133
vascular smooth muscle from normal and hypertensive rats, 2:127
Recent
dietary trace element research, exemplified by tin, fluorine, and silicon, 6:1748
food consumption surveys and their uses, 11:2270
Regulation of
heat production at the cellular level, 10:2162
iron absorption, 1:100
Relationship between
the psychophysics and the neurophysiology of sound localization, 8:1924
cerebrospinal fluid and interstitial fluid of brain, 9:2075
Renal function, prostaglandins and, 1:39
Reporter's view of poster sessions, 19:2095
Reproductive cycle, prostaglandins and the, 1:61
Respiration at high altitude, 10:2126, 2136
Retina, turtle, feedback loop between cones and horizontal cells in the, 4:1078
Retinal photoreceptors, structural aspects, synaptic actions on, 4:1069
Review of development of adipose tissue cellularity in man and animals, 8:1952
RNA synthesis, novel inhibitors of, 11:2281
Role of
auditory cortex in sound localization: a comparative ablation study of hedgehog and bushbaby, 8:1917
cyclic AMP in synaptic transmission in the mammalian peripheral nervous system, 4:1059

Salt and water transport in the loop of Henle, membrane characteristics governing, 1:25
Sara Leslie, Publications Manager, American Physiological Society, 10:2096
Science education: simulation methods for teaching process and content, 9:2008

Science News

The degu—for immunology study, 2:118
International Congress of Physiological Sciences, 4:1033
A registry of women and minority group biochemists is being established, 5:1122
Rosenstiel award, 8:1878
The scientific manpower commission, 1:9
The UCLA health sciences computing facility, 12:2309
Selective immunosuppression
by drugs in balanced immune responses, 8:1882
using antigens and antibodies as pharmacologic agents, 8:1886
Sensory interactions in the nudibranch mollusk *Hermissenda crassicornis*, 4:1083
Serum immunoglobulin levels in older humans, longitudinal changes in, 9:2036
Silicon as an essential element, 6:1758
Simulation of
animal functions in models of production systems: ruminants on the range, 2:188
biological systems at the level of biochemistry and physiology, 2:176
Sodium transport in the distal nephron, 1:31
Solid tissue masses formed in vitro from cells cultured on artificial capillaries, 8:1978
Sound localization,
development of some mechanisms useful in, 8:1928
in the ear and brainstem of mammals, adaptation for, 8:1904
neurophysiological mechanisms of, 8:1911
relations between the psychophysics and the neurophysiology of, 8:1924
role of auditory cortex in: a comparative ablation study of hedgehog and bushbaby, 8:1917

Special Articles

Bioavailability of iron sources and their utilization in food enrichment, 7:1779

Cost analysis and consequences of the National Cancer Plan, **11**:2225
Institute of laboratory animal resources, **4**:1036
Neurosciences research program, **1**:6
Proteolytic processing in the biosynthesis of insulin and other proteins, **10**:2105
Technology assessment and the politics of American biomedicine, **2**:114
Tight and leaky junctions of epithelia: a perspective on kisses in the dark, **11**:2220
Ultrastructure of membrane lesions in immune lysis, osmotic lysis and drug-induced lysis, **10**:2116
Vitamin D: the vitamin and the hormone, **11**:2211
Why FASEB? Mission, operations and financing, **6**:1686

Special Topics

Biomedical education, **9**:1991–2016
Biomedical literature and information services, **6**:1693–1724
Sponsorship of computing research in medicine and biology, **12**:2413
Spontaneous autoimmunity and involution of the lymphoid system, **9**:2051
State-dependent learning,
alcoholic blackout and, **7**:1833
differentiating stimulus and storage hypotheses of, **7**:1797
experimental methods for the study of, **7**:1800
Stereology applied to structure-function relationships in pharmacology, **10**:2187
Sterol carrier protein hypothesis, **6**:1733
Surfactant system of the lung, **11**:2238
Sympathetic ganglia,
embryological development of metabolic systems in, **4**:1039
metabolism of mammalian, **4**:1043

Symposia

Antibiotics and neoplasia, **11**:2281–2306
Biochemical aspects of pulmonary function, **11**:2231–2262
Cerebrospinal fluid and the extracellular fluid of the brain, **9**:2061–2085
Collagen formation, **5**:1197–1218
Control of feeding and the regulation of energy balance, **5**:1139–1176
Discriminable properties of drugs and state-dependent learning, **7**:1785–1836
Drugs and the immune response, **8**:1881–1898
Ecological problems of high level nutrient feeding, **5**:1177–1196
Immunopathology of aging, **9**:2017–2060
Influence of exercise on the morphology and metabolism of the isolated fat cell, **8**:1947–1968
Metabolism in relation to function in ganglia and peripheral nerves in vertebrates, **4**:1039–1068
Metabolism of membrane lipids, **6**:1725–1746
Newer candidates for essential trace elements, **6**:1747–1775
Nutritional potential for recycling waste, **8**:1933–1946
Pharmacological and biochemical properties of microtubule proteins, **2**:151–174
Pharmacology—morphology, **10**:2171–2206
Physiological adaptations to the environment, **10**:2125–2170
Prostaglandins, **1**:37–86
Recent development in research methods and instrumentation, **8**:1969–1982
Regulation of protein turnover, **4**:1091–1120
Renal handling of sodium, **1**:13–36
Restriction and modification of DNA: enzymes and substrates, **5**:1125–1138
Some recent advances in human nutrition research, **11**:2263–2280
Sound localization, **8**:1899–1932
Synaptic actions on retinal photoreceptors, **4**:1069–1090
Tracer methodology and glucose turnover, **7**:1837–1876
Vascular reactivity in hypertension, **2**:121–150
Synaptic actions on retinal photoreceptors: structural aspects, **4**:1069

Temperature acclimation and behavioral thermoregulation in cold-blooded animals, **10**:2155, 2170
Theoretical explanations of drug-dissociated behaviors, **7**:1787
Thymosin and the immunopathology of aging, **9**:2053
Thyroid gland, prostaglandins and the, **1**:78
Tracer methods in intact animals, validity of the rates of production and utilization of metabolites as determined by, **7**:1841
Transport
mechanisms in the choroid plexus, **9**:2064
of material between brain extracellular fluid, brain cells and blood, **9**:2070
Two-compartment calculator for the dog glucose pool in the nonsteady state, **7**:1869

Ultrafiltration, glomerular, **1**:14
University of Sheffield biomedical information service, **6**:1698
Use of
a psychiatric patient record system, **12**:2379
restriction endonucleases in analyzing the genome of simian virus 40, **5**:1135
table file structures in a clinical research center, **12**:2384

Validity of the rates of production and utilization of metabolites as determined by tracer methods in intact animals, **7**:1841
Vanadium as an essential element, **6**:1773
Vascular
smooth muscle, from normal and hypertensive rats, reactivity of, **2**:127
reactivity, determinants of, **2**:121
reactivity in man, effects of sodium, angiotensin, and steroids on, **2**:143

Author Index to Volume 33[1]

Abboud, F., 2:143
Achs, M. J., 2:176
Adler, S. P., 5:1135
Alkon, D. L., 4:1083
Allen, C., 2:167
Altman, P. L., 6:1701
Altszuler, N., 7:1869
Amarel, S., 12:2341
Amendola, R. C., 12:2365
Anderson, M. J., 4:1036
Andres, R., 7:1865
Andrews, L. C., 12:2402
Anthony, W. B., 8:1939
Apter, J. T., 12:2313
Ashenhurst, R. L., 12:2405
Augustine, J., 12:2309
Austen, K. F., 11:2256

Babirak, S. P., 8:1956
Baile, C. A., 5:1166
Baker, D. E., 5:1188
Baldwin, R. L., 2:175, 188
Bamburg, J. R., 2:158
Barkla, J. K., 6:1698
Barnett, C. A., 4:1105
Barr, W. J., 12:2395
Barry, C. D., 12:2368
Barry, H., III, 7:1814
Baruch, J. J., 12:2412
Bates, D. V., 10:2133
Baumgardt, B. R., 5:1139
Bayley, H. S., 1:94
Baylor, D. A., 4:1074
Beacham, I. R., 6:1725
Bedford, C. L., 11:2264
Bergman, E. N., 7:1849
Bering, E. A., Jr., 9:2061
Berman, H. M., 12:2402
Berman, M., 7:1865
Berne, R. M., 8:1877; 10:2100
Bernstein, F. C., 12:2402
Bernstein, H. J., 12:2402
Blair, R., 8:1934
Blanken, R. R., 6:1719
Blasberg, R. G., 9:2070
Bleich, H. L., 12:2317
Bliss, D. K., 7:1787
Bohr, D. F., 2:127
Bolender, R. P., 10:2187
Booth, M. A., 8:1959
Booth, M. J., 8:1959
Borisy, G. G., 2:167
Borovec, R. T., 12:2365
Bosshard, H. E., 12:2368
Bottle, R. T., 6:1693
Bowdon, E. K., Sr., 12:2395
Boyer, H. W., 5:1125, 1900
Bray, G. A., 5:1140
Brenner, B. M., 1:13, 14
Brockman, R. P., 7:1849
Brockman, W. W., 5:1135
Brody, M. J., 1:48
Bryan, J., 2:152
Buchanan, J. M., 9:1998
Buckley, C. E., III, 9:2036
Buckley, E. G., 9:2036
Burg, M., 1:31
Buskirk, E. R., 8:1948
Butler, R. A., 8:1920

Calabresi, P., 8:1882
Calvert, C. C., 8:1938
Campbell, W. J., 10:2099
Carlisle, E. M., 6:1758
Carrell, H. L., 12:2402
Cattell, McK., 10:2103
Cho, C. Y., 1:94
Christensen, R., 12:2415
Clark, D. E., 12:2419
Clark, F., 11:2270
Clark, W. G., 1:2
Clement, B. M., 10:2094
Clements, J. A., 11:2231
Cohen, G. H., 9:2053
Collen, M. F., 12:2376
Cox, J. R., Jr., 12:2357
Creswell, K. M., 2:158
Cronan, J. E., Jr., 6:1725
Crowshaw, K., 1:39
Crystal, R. G., 11:2248
Cserr, H. F., 9:2075
Curran, P. F., 10:2096

Danna, K. J., 5:1135
Dardenne, M., 9:2053
Davis, G. K., 5:1194
Davis, L. S., 12:2376
Davis, R. M., 12:2409
Day, M. S., 6:1717
Day, S. B., 6:1699
Dayhoff, M. O., 12:2314
Deen, W. M., 1:14
Dell'Orco, R. T., 8:1969
DeLuca, H. F., 11:2211
Devlin, T. M., 9:1994
Diamond, I. T., 8:1917
Diamond, J. M., 11:2220
DiLorenzo, J., 8:1882
Dixon, F. J., 9:2057
Dolivo, M., 4:1043
Dorsey, F. C., 9:2036
Dzubow, L., 2:176

Ellis, R. A., 12:2368
Emerick, R. J., 5:1177, 1183
Ericson, R. P., 12:2379
Erulkar, 8:1928
Eskin, B., 5:1128

Feigenbaum, E. A., 12:2331
Felig, P., 4:1092
Fenstermacher, J. D., 9:2070
Field, J. B., 1:78
Fisher, D. A., 6:1714
Flanagan, D., 6:1721
Fontenot, J. P., 8:1936
Frank, C. B., 4:1036
Fredericks, H. G., 7:1778
Fuller, H. L., 1:87

Gable, D. A., 8:1945
Garb, S., 4:1030
Garfinkel, D., 2:176
Gavey, K. L., 6:1733
Gee, H. H., 12:2329
Gibbs, J., 5:1146
Gidez, L. I., 10:2097
Giese, R. L., 12:2393
Glasel, J. A., 8:1973
Glueck, B. C., 12:2379
Goldberg, A. L., 4:1112
Goldberg, D. C., 12:2387
Goldhaber, P., 1:81
Goldstein, A. L., 9:2053
Good, R. A., 6:1699; 9:2040
Goodwin, D. W., 7:1833
Gortner, R. A., Jr., 11:2263
Graber, G., 8:1945
Green, D. E., 10:2147
Green, T. R., 11:2207
Greenberg, L. J., 9:2017
Greengard, P., 4:1059
Greenwood, M. R. C., 8:1952
Grisham, L. M., 2:158
Griswold, D. E., 8:1882

Hansbury, E., 6:1733
Harder, M. E., 6:1725
Harrington, R. B., 12:2393
Harrison, J. M., 8:1901
Harte, R. A., 10:2087
Heart, F. E., 12:2399
Heppner, G. H., 8:1882
Hess, E. L., 1:1; 6:1686; 9:1983, 10:2089
Hetenyi, G., Jr., 7:1841
Heumann, K. F., 1:3; 6:1693; 10:2095
Hind, J. E., 12:2351
Hochachka, P. W., 10:2162
Hökfelt, T., 10:2177
Holmes, J. H. G., 1:94
Hooper, J. A., 9:2053
Hopkins, L. L., Jr., 6:1773
Horwitz, S. B., 11:2281
Howell, E. M., 4:1112

Insel, P. A., 7:1865
Itskovitz, H. D., 1:39

Jefferson, L. S., 4:1098
Johansson, B., 2:121
Jones, A. W., 2:133
Jukes, T. H., 1:2

Kadowitz, P. J., 1:48
Kaufman, C. F., 7:1849
Kebabian, J. W., 4:1059
Kehl, T. H., 12:2373
Kemmler, W., 10:2105
Kennedy, H. E., 6:1714
King, R. J., 11:2238
Kirklin, J. W., 12:2326
Klein, R. L., 10:2171, 2195
Knazek, R. A., 8:1978
Koetzle, T., 12:2402
Kokko, J. P., 1:25
Kostyo, J. L., 9:2005

[1] This index covers volume 33 with the exception of no. 3 and no. 5, part II, the abstract issues, which carry their own author indexes. For each listing the first number, in bold face, which precedes the colon, refers to the issue number; the second number, or numbers, refer to the page number.

Kramer, K. J., 7:1865
Kraut, C. W., 11:2264
Krudy, E. S., 6:1695
Kupchan, S. M., 11:2288

Labhsetwar, A. P., 1:61
Lackey, D., 5:1128
LaDue, E. L., 2:196
Langridge, R., 12:2332
Lasansky, A., 4:1069
Lautenberger, J. A., 5:1128
Leblond, C. P., 5:1205
Lee, T. N. H., 5:1135
Lee, Y. C., 11:2264
Leibman, K. C., 10:2101
Leisner, R. S., 1:3; 10:2097
Leive, L., 11:2207
Lemp, H. B., 10:2091
Leveille, G. A., 11:2264
Levine, L., 1:81
Levinthal, C., 12:2336
Lewis, C., 11:2303
Li, J. B., 4:1112
Liljenquist, J. E., 7:1865
Lindberg, D. A. B., 12:2311, 2418
Linn, B. S., 5:1128
Lorenzo, A. V., 9:2079
Lucas, E. W., 8:1945
Lykos, P., 12:2389
Lyle, L. R., 8:1889

Macagno, E., 12:2336
Macey, R. L., 12:2323
Maclaren, N. K., 6:1682
Maeda, B. T., 2:188
Maher, R. M., 12:2416
Makinodan, T., 9:2033
Marchisio, P. C., 4:1039
Marcum, J. M., 2:167
Marshall, G. R., 12:2368
Martel, S. B., 4:1112
Mashiter, K., 1:78
Masterton, R. B., 8:1904
Matukas, V. J., 5:1197
McCormick, B. H., 12:2365
McDaniel, M. C., 9:2053
McGarr, J. A., 8:1956
McGiff, J. C., 1:39
McKibbin, J. B., 4:1105
McShulskis, J. E., 12:2308
Mertens, D. R., 8:1942
Mertz, W., 11:2275
Meyer, E. F., Jr., 12:2402
Miller, E. J., 5:1197
Miller, W. J., 6:1747
Mizel, S. B., 2:158
Mohr, H. E., 6:1773
Molnar, C. E., 12:2357
Moraff, H., 12:2413
Morgan, H. E., 4:1091, 1098
Morimoto, C. N., 2402
Morris, J. G., 2:188
Moushegian, G., 8:1924
Mullins, L. J., 9:1991
Munger, B. L., 4:1098

Nathans, D., 5:1135
Neff, W. D., 8:1899
Nesheim, R. O., 11:2267
Newton, C. M., 12:2307, 2319
Nielsen, F. H., 6:1767
Nitisewojo, P., 10:2147
Nordin, A. A., 9:2033
Norwich, K. H., 7:1841, 1855

Ochs, S., 4:1049
Offner, F. F., 2:113
Ogston, A. G., 9:1984
Old, L., 6:1699
Oldstone, M. B. A., 9:2057
Ollerich, D. A., 6:1767
Olmsted, J. B., 2:167
Oscai, L. B., 8:1956
Overton, D. A., 7:1785, 1800

Pace, N., 10:2126
Palmer, W. K., 8:1964
Panksepp, J., 5:1150
Parker, C. W., 8:1881, 1889
Patlak, C. S., 9:2070
Pekar, P. P., Jr., 11:2225
Peterson, J. D., 10:2105
Pitot, H. C., 9:2013
Polansky, M. M., 11:2275
Pollack, H., 7:1777
Pollay, M., 9:2064
Poplin, E. A., 8:1982
Pratt, A. W., 12:2361
Prouty, W. F., 4:1112

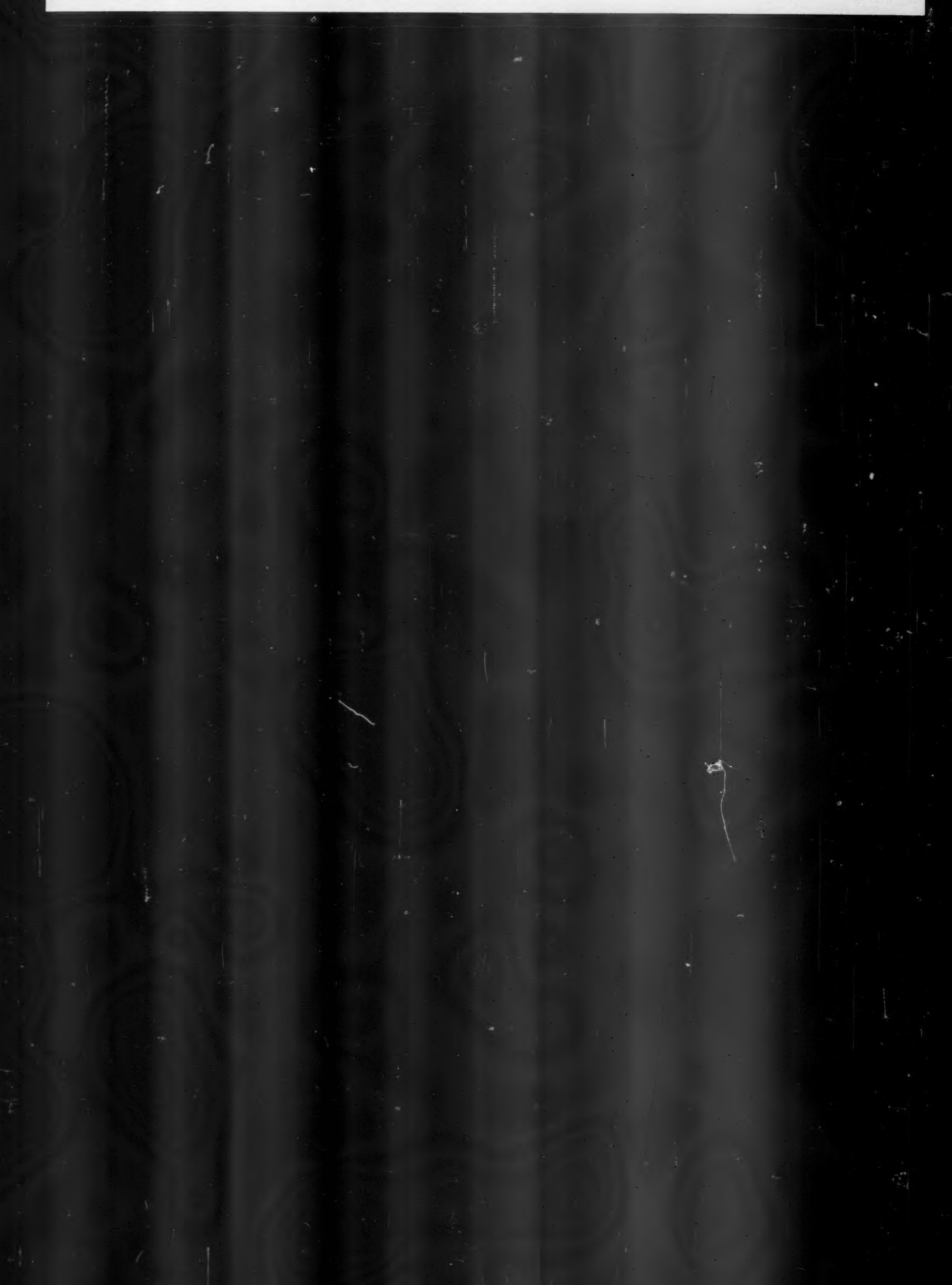
Radziuk, J., 7:1855
Raiti, S., 6:1682
Ramberg, C. F., Jr., 2:183
Rannels, D. E., 4:1098
Ransil, B. J., 12:2384
Raub, W. F., 12:2390
Ravizza, R., 8:1917
Read, J. S., 12:2365
Reddy, D. R., 12:2347
Rhode, W. S., 12:2351
Rice, J. R., 10:2093
Rice, R. W., 2:188
Riker, W. F., Jr., 9:1992
Roberts, J. L., 10:2155
Robertson, C. R., 1:14
Roginski, E. E., 11:2275
Rostami, H., 7:1869
Roth, S., 4:1031
Rupert, A. L., 8:1924

Sack, G. H., Jr., 5:1135
Saltzberg, B., 12:2355
Scallen, T. J., 6:1733
Schmidt-Nielsen, B., 10:2125, 2137
Schneider, D. M., 1:6
Schneider, H. A., 2:114
Schulof, R. S., 9:2053
Schwarz, K., 6:1748
Seeman, P., 10:2116
Seetharam, B., 6:1733
Sheppard, L. C., 12:2326
Shepro, D., 10:2102
Sherwin, R. S., 7:1865
Shipton, H., 12:2375
Silbert, D. F., 6:1725
Siler, W., 12:2411, 2420
Siskind, G. W., 8:1886
Small, P. A., Jr., 9:2008
Smith, G. P., 5:1146
Smith, N. E., 2:196
Snook, J. T., 1:88
Southard, J., 10:2147
Spirakis, C. N., 8:1956
Srikantaiah, M. V., 6:1733
Starkweather, J. A., 12:2376
Starr, A., 8:1911
Steele, R., 7:1869
Steiner, D. F., 10:2105
Stern, B. T., 6:1719
Stern, J. S., 8:1952
Stodola, R. K., 12:2402
Stoner, L., 1:31
Stroebel, C. F., 12:2379
Stutman, O., 9:2028

Tager, H. S., 10:2105
Tan, E. M., 8:1894
Tashjian, A. H., Jr., 1:81
Tate, F. A., 6:1712
Taylor, A. W., 8:1959
Taylor, J. C., 8:1945
Teague, P. O., 9:2051
Terdiman, J. F., 12:2376
Thureson-Klein, Å. K., 10:2171, 2195
Thurman, G. B., 9:2053
Tierney, D. F., 11:2232
Tipton, C. M., 8:1947, 1964
Tobian, L., 2:138
Tobin, J. D., 7:1865
Toepfer, E. W., 11:2275
Tountas, C., 12:2336
Turk, D. E., 1:106

Umezawa, H., 11:2296
Uvnäs, B., 10:2172

Van Brunt, E. E., 12:2376
Van Campen, D., 1:100
Van Soest, P. J., 8:1942
Vestling, C. S., 4:1029
Vetter, B. M., 1:9
Viets, F. G., 5:1178
Villarreal, J., 12:2402
Voelkel, E. F., 1:81
Vranic, M., 7:1837, 1855

Waddell, J., 7:1779
Wadzinski, L. T., 12:2323
Wahren, J., 4:1092
Waitzman, M. B., 6:1677
Walford, R. L., 9:2020
Webb, K. E., Jr., 8:1936
Weeks, J. R., 1:37
Weinstock, M., 5:1205
Westhead, E. W., 6:1679
White, A., 9:2053
Whitfield, I. C., 8:1915
Wicks, W. D., 4:1105
Wilson, K. R., 12:2407
Wilson, L., 2:151, 158
Winbury, M., 5:1121
Windhager, E. E., 1:21
Winter, J. C., 7:1785, 1825
Wright, D. C., 7:1797

Yager, R. H., 4:1036
Young, R. C., 5:1146
Young, R. J., 8:1933
Yunis, E. J., 9:2017, 2040